

PATOKA LAKE
Crawford, Dubois, and Orange Counties
2005 Fish Management Report

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EXECUTIVE SUMMARY

- Patoka Lake is an 8,800-acre flood control reservoir. There are 11 boat ramps surrounding the lake. The lake is best known for its quality largemouth bass and channel catfish fishing. The lake also has good fishing for white crappie, white bass, and striped bass.
- There were three surveys conducted in 2005. A supplemental survey in May, a largemouth bass tournament monitoring survey that ran from March through October, and a striped bass survey that occurred in October.
- In the supplemental survey, 21 fish species were sampled. The total catch was 3,950 fish that weighed approximately 930.33 lbs. Bluegill were most abundant by number followed by gizzard shad, largemouth bass, and longear sunfish. Largemouth bass were most abundant by weight followed by gizzard shad and bluegill.
- The largemouth bass tournament monitoring survey includes results for 53 tournament days. A total of 5,163 anglers fished in the reporting tournaments weighing-in a total of 4,294 legal size bass that weighed an estimated 11,928.42 lbs. The average weight and length of a weighed-in bass was 2.77 lbs and 16.9 in.
- Age-0 striped bass sampling accounted for 11 striped bass that ranged in length from 4.7 to 5.6 in. The electrofishing catch rate was 1.8/h. Adult sampling resulted in 39 striped bass that weighed 332.44 lbs. They ranged in length from 20.4 to 35.5 in and the largest weighed 15.25 lbs. The gill net catch rate was 2.1/lift.

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INTRODUCTION

Patoka Lake is an 8,800-acre flood control impoundment located in Crawford, Dubois, and Orange Counties. The reservoir was created in 1977 when a dam was completed across the Patoka River 13 mi east of Jasper. The Department of Natural Resources (DNR) operates seven State Recreation Areas at the lake. The Newton-Stewart State Recreation Area is the most developed with campgrounds, swimming beach, visitors center, marina, and other attractions. Eleven boat launching ramps provide anglers and boaters access to the lake. The Kings Bridge boat ramp is an unimproved ramp while the other boat ramps are concrete. There is a \$5.00 non-motorized and \$20.00 motorized annual lake pass for boats. If accessing the lake through the Newton-Stewart Recreation Area there is also an additional entrance fee of \$5.00 for a daily or \$36.00 for an annual gate pass. Areas for bank fishing are numerous and are located by any road bordering the lake.

Largemouth bass were protected by a 14-in minimum length limit through 1988. A 12 to 15-in bass slot size limit was enacted in May 1989 and was changed in 1996 to a 15-in minimum length limit. This regulation was also timely due to the appearance of gizzard shad in June 1996 (Stefanavage 1997).

In 2004 the largemouth bass population's size structure continued to improve. However, there was concern that the high PSD was also indicating poor recruitment. The electrofishing catch rate for bass shorter than 12 in decreased by 40%. The bluegill population is still in poor condition compared to the preshad years. Only 2% of the bluegill sample consisted of fish larger than 7 in. All of the bluegill population indices have substantially declined since 1996.

The 2005 supplemental survey and bass tournament monitoring were conducted under Division of Fish and Wildlife (DFW) work plan 200739. The striped bass survey was conducted under work plan 204136.

METHODS

Supplemental survey

The survey was conducted from May 10 through May 17, 2005. The lake was divided into seven basins, each roughly 1,250 acres in size. Three of the basins were randomly selected and each received 1.0 h of night electrofishing for a total of 3.0 h. Electrofishing was further broken down into 15-min stations to representatively sample different types of habitat such as

wood, rock, aquatic vegetation, and relatively open shorelines. Two individuals collected fish stunned by the electrofisher.

Fish collected were measured to the nearest 0.1 in TL. Weights for all species, except largemouth bass, were determined from the 1999 fish management survey data (Carnahan 2000).

Largemouth bass weights were determined from the 2002 fish management survey data (Carnahan 2004). Proportional stock density (PSD) and relative stock density (RSD) indices were used to evaluate the largemouth bass and bluegill populations (Anderson and Neuman 1996). The bluegill fishing potential index (BGFP) was used to evaluate the quality of the bluegill fishing (Ball and Tousignant 1996). A single factor analysis of variance statistical test was used to compare some of the pre and post gizzard shad era data. Scale samples were taken from a subsample of sport fish for age and growth determination.

Largemouth bass tournament monitoring

Organizations conducting tournaments were mandated by their permit to record and send in their bass tournament data to the Tri-Lakes Fisheries Station. Data sheet information included hours fished, number of participants, big bass weight, total weight, total number weighed-in, and bass lengths to the nearest 0.5 in.

Striped bass survey

Age-0 striped bass were sampled with pulsed D.C. night electrofishing on October 4 and 5. One dipper collected the stunned striped bass. Twenty-four 15-min electrofishing stations were randomly selected throughout the main lake basin for a total electrofishing effort of 6.0 h. Adult striped bass were sampled from October 10 through October 19 with 18-gill net lifts. The experimental gill nets were 300 ft long multifilament nylon with bar mesh sizes ranging from 1.5 to 3.0 in. The gill nets were suspended 6 ft deep with the aid of 5 large floats spaced evenly along the float line. All striped bass were measured to the nearest 0.1 in and weighed to the nearest 0.25 lb. Otoliths were used for age and growth determination.

RESULTS

Supplemental survey

Twenty-one fish species were sampled. The total catch was 3,950 fish that weighed approximately 930.33 lbs (Appendix 1). Bluegill were most abundant by number followed by gizzard shad, largemouth bass, longear sunfish, and warmouth. Largemouth bass were most abundant by weight followed by gizzard shad, bluegill, spotted sucker, and common carp. The remaining species collectively accounted for 7% of the collection by number and 14% by weight. Other game fish species sampled were smallmouth bass, channel catfish, flathead catfish, and white bass. The 17 smallmouth bass ranged in length from 3.7 to 13.3 in. The 13 channel catfish ranged in length from 7.7 to 26.5 in. Flathead catfish are starting to become more abundant as 13 were sampled that ranged in length from 6.4 to 18.5 in.

A total of 1,888 bluegill was sampled that weighed approximately 85.88 lbs. Bluegill ranged in length from 1.1 to 7.4 in. Bluegill ranked first in relative abundance by number (48%) and third by weight (9%). Relative abundance in 2004 was similar to 2005 results. The electrofishing catch rate increased from 497/h in 2004 to 629/h primarily due to the increased catch of 1.0 to 2.9 in bluegill. Bluegill growth was average when compared to the district's average, however, it has substantially declined since 1996 (Figure 1). For example, an age-5 bluegill in 1996 averaged 8.8 in compared to 6.4 in in 2005. Bluegill were collected up to age-6 and that year class averaged 6.9 in.

The bluegill PSD remained the same at 8 (Figure 2). The PSD's have been less than 11 since 1998 and are significantly lower since 1996 ($F_{(1,10)} = 16.81, P < 0.01$). The PSD should be in the range of 20 to 60 for a balanced population. The bluegill RSD 7 has been 1 the last 3 years and the RSD 8 has been 0 since 1998. Both indices have significantly decreased since 1996 ($F_{(1,11)} = 93.32, P < 0.01$) and ($F_{(1,11)} = 57.09, P < 0.01$) (Figure 3).

The BGFP value increased from 11 to 13 (out of a possible 40), which rates bluegill fishing at the low end of the "fair" range. The BGFP has ranged from 8 to 11 since 1998. The highest BGFP recorded was 24 in 1996.

A total of 888 gizzard shad was sampled that weighed approximately 113.72 lbs. They ranged in length from 3.6 to 12.1 in. Gizzard shad accounted for 23% of the sample by number and 12% by weight. The shad electrofishing catch rate decreased from 370.0

to 296.0/h. Previous electrofishing catch rates ranged from 274.0 (2002) to 1,401.0/h (2001).

A total of 430 largemouth bass was sampled that weighed 422.80 lbs. They ranged in length from 2.5 to 21.4 in. Relative abundance was 11% by number and 45% by weight. Relative abundance in 2004 was 7% by number and 24% by weight. The electrofishing catch rate increased 64% to 143.3/h. The largest catch rate increase by length class was 112% for 8.0 to 12.0 in bass. Bass catch rates increased 66% for bass in the 3.0 to 8.0 in length range, 47% for bass 15.0 to 20.0 in in length, and doubled for bass over 20.0 in. Bass growth was good with age-4, 5, 6, and 7 bass averaging 13.6, 15.4, 17.1, and 18.5 in (Appendix 1). Bass are growing 2.0 to 2.5 in per year through age 9.

The bass PSD decreased from 65 (2004) to 53 and is currently in the correct range (40 to 70) for a balanced population (Figure 2). The PSD has significantly increased since 1996 ($F_{(1,11)} = 24.58, P < 0.01$). The RSD 15 index value (27) has significantly increased since 1996 ($F_{(1,11)} = 9.54, P = 0.01$) (Figure 4). The RSD 17 index has also significantly increased since 1996 to 11 ($F_{(1,11)} = 6.28, P = 0.02$). The RSD 18, 19, and 20 were approaching significant changes compared to pre 1997 data. The RSD 18, 19, and 20 values are 7, 3, and 2 which are substantial changes from the 1, 1, and 0 recorded in 1996.

Eighty-seven redear sunfish were sampled that weighed 23.24 lbs. They ranged in length from 2.8 to 10.3 in. Relative abundance was 2% by both number and weight. The electrofishing catch rate increased from 6.0 to 29.0/h. Redear sunfish growth was similar to 2004 and at the low end of the average range when compared to the district's averages.

A total of 64 white crappie and 22 black crappie was sampled during the survey. White crappie ranged in length from 3.5 to 12.7 in, while black crappie ranged from 3.8 to 10.3 in. Relative abundance by number and weight were 1% for both species. The electrofishing catch rates were 21.3/h for white crappie and 7.3/h for black crappie. In 2004, the white and black crappie electrofishing catch rates were 6.0 and less than 1.0/h. White crappie growth improved for ages 2 through 4 while age-5 growth remained the same when compared to 2004 results. Age-3, 4, and 5 white crappie averaged 8.3, 9.5, and 9.9 in. Black crappie growth was similar to 2004 results for all ages.

Largemouth bass tournament monitoring

Fifty-three tournament days were reported compared to 26 in 2004. Twenty-three tournament days were in the spring (March through May), 17 during the summer (June through August), and 13 in the fall (September and October). A total of 5,163 anglers fished in the reporting tournaments. Anglers weighed-in a total of 4,294 legal size bass that weighed an estimated 11,928.42 lbs (Appendix 2). The average weight and length of a weighed-in bass was 2.77 lbs and 16.9 in. The overall catch rate decreased from 0.143 to 0.093 legal size bass weighed-in/h, which equates to 10.6 h fished/legal bass weighed-in. The spring tournament catch rate has been greater than 0.100 legal size bass weighed-in/h since 2002 and this year it decreased from 0.146 to 0.102 (Figure 5). The average weight of the big bass weighed-in was 5.42 lbs and the heaviest bass was 7.60 lbs.

Striped bass survey

Patoka Lake received its first striped bass stocking on June 26, 1997. Striped bass were not stocked in 2000, 2003, and 2004 due to problems with hatchery production. A total of 51,873 fingerlings were stocked in 2005 bringing the total number stocked to 578,873 since 1997. Age-0 striped bass sampling accounted for 11 striped bass that ranged in length from 4.7 to 5.6 in (Appendix 3). The electrofishing catch rate was 1.8/h. Previous age-0 electrofishing catch rates were 20.0 (1997), 82.0 (1998), 17.0 (1999), 0.5 (2001), and 226.0/h (2002).

Thirty-nine adult striped bass were sampled that weighed 332.44 lbs. They ranged in length from 20.4 to 35.5 in and the largest weighed 15.25 lbs. The gill net catch rate was 2.1/lift (Appendix 3). Previous gill net catch rates were 3.6 (2002), 4.5 (2003), and 3.6/lift (2004). All the striped bass sampled originated from the 1998, 1999, 2001, and 2002 stockings. Ages-3, 4, 6, and 7 striped bass averaged 21.1, 26.0, 29.1, and 31.7 in (Appendix 3).

DISCUSSION

Patoka Lake's fishery has not changed much since 2004. Bluegill outnumbered gizzard shad for the fourth straight year. Bluegill stock density indices (PSD, RSD 7 and 8) have not changed and indicate that fish less than 6.0 in continue to dominate the bluegill population. Very few 7.0 in and larger bluegill are present in the population. The low numbers of big bluegill are

due to poor growth caused by competition with gizzard shad. Growth will likely continue to decrease with the increased catch rate of 1.0 to 2.9 in bluegill. According to the BGFP, Patoka Lake is not a quality bluegill fishing lake.

The largemouth bass relative abundance by number increased to 11% and the relative abundance by weight nearly doubled. This was due to the unusually low 2004 bass electrofishing catch rate and the low catch rates of channel catfish and “other” fish species in 2005. The bass electrofishing catch rate in 2005 was substantially higher than the previous 3 years for all lengths of bass except the 12.0 to 15.0-in group which only slightly increased. The bass PSD decreased to 53 due to the increase of 8.0 to 12.0-in fish. This decrease was actually good because the 2004 PSD of 65 was approaching the upper limits of the “balanced” fishery range. Once the PSD gets over 70 there is actually a disproportionate number of bass over 12 in compared to the number of bass under 12 in. The RSD 15 through 20 indicate that there is a large proportion of big bass in the fishery. The high proportion of big bass is due to good growth. The age-length key in Appendix 1, indicates that bass are growing 2.0 to 2.5 in per year through age 9. Bass growth should be sustainable due to the abundant forage including gizzard shad, stunted bluegill, longear sunfish, warmouth, spotted sucker, and green sunfish. These forage species have a combined relative abundance by number of 82%. Bass tournament results reflect the high abundance of larger bass. The tournament catch rate was 10 h fished/legal bass compared to 1996 when it was 38 h fished/legal bass. The average length of the 4,294 bass weighed-in was nearly 17 in.

The white crappie population has shown some improvement in growth since 2004 with increased back calculated average lengths for ages 2 through 4. However, white crappie growth is poor when compared to white crappie growth at Hovey Lake. Hovey Lake white crappie growth for ages 3 through 5 average 9.0, 11.1, and 12.4 in, while the averages for Patoka’s white crappie are 8.3, 9.5, and 9.9 in.

Patoka’s striped bass population is providing a new exciting fish for anglers to catch in southwest Indiana. Fishing for striped bass should continue to improve if the lake receives its annual stocking of 44,000 fingerlings. Currently, the fishery is good and is being sustained by 4 year-classes of striped bass. The stocking this year was the second one to fail of the six stockings since 1997.

Channel catfish were not representively sampled during this survey since gill nets were not used. Fishing for channel catfish is excellent at the lake according to past survey results.

Other game fish species starting to show up in greater numbers are smallmouth bass and flathead catfish. When sampling these species in their preferred habitat their catch rates substantially increased.

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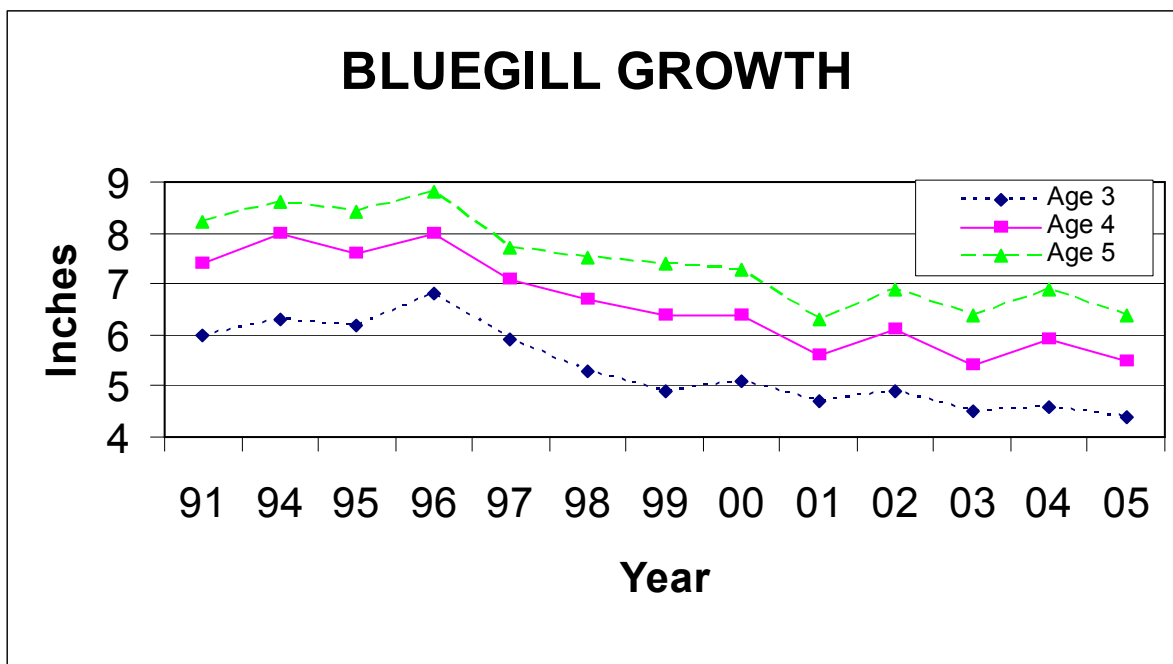


Figure 1. Bluegill growth for ages 3 through 5, Patoka Lake 1991 through 2005.

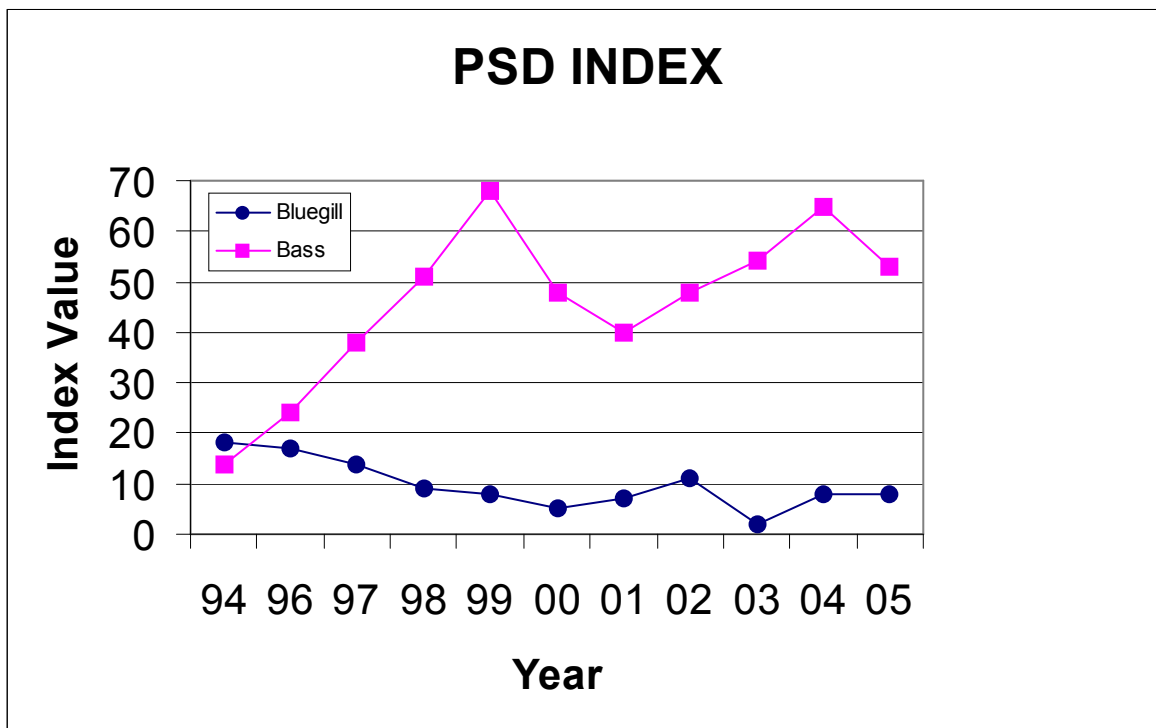


Figure 2. Bluegill and largemouth bass proportional stock density (PSD) index values, Patoka Lake 1994 through 2005.

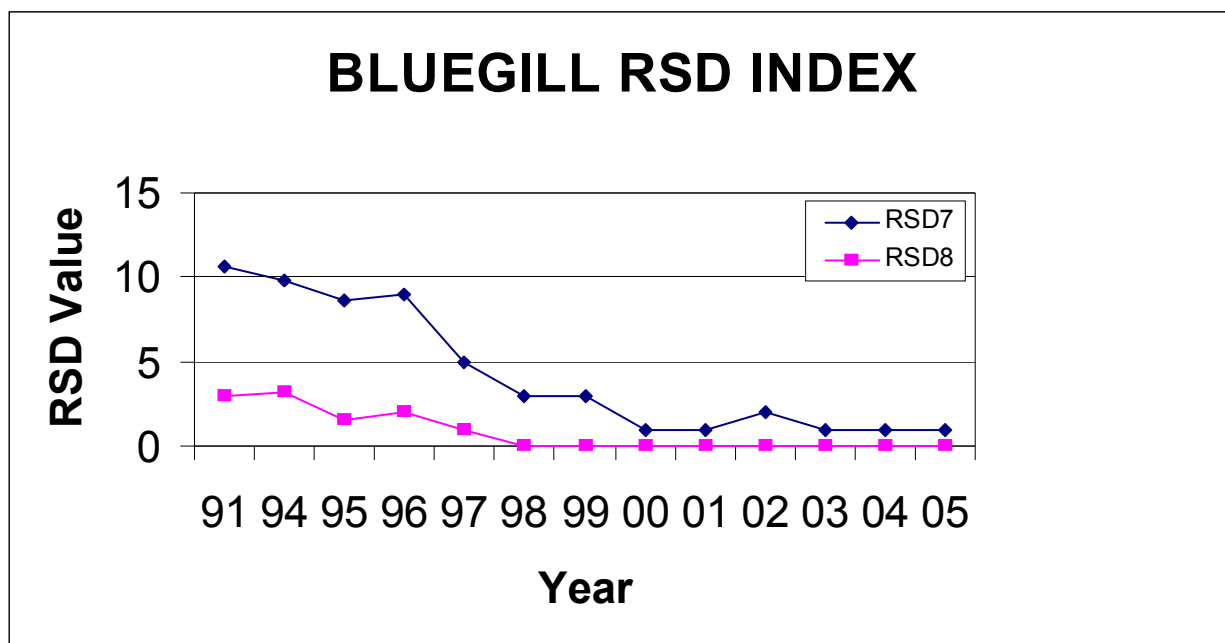


Figure 3. Bluegill relative stock density (RSD) index values, Patoka Lake 1991 through 2005.

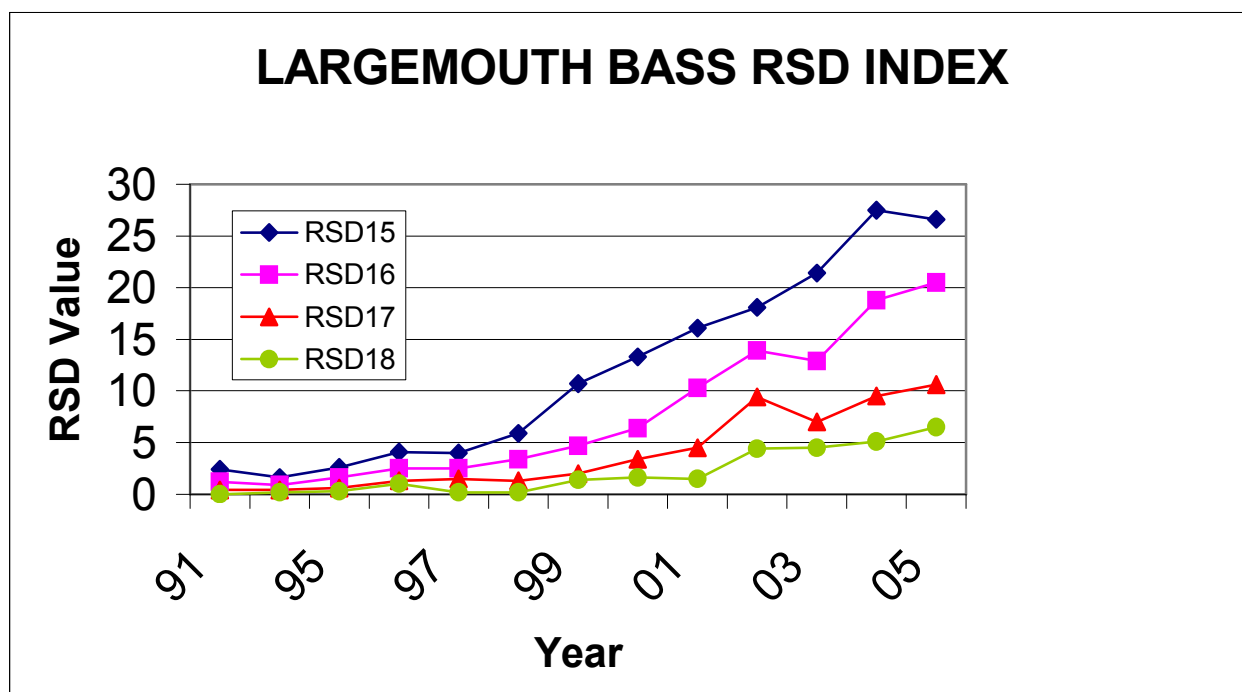


Figure 4. Largemouth bass relative stock density (RSD) index values, Patoka Lake 1991 through 2005.

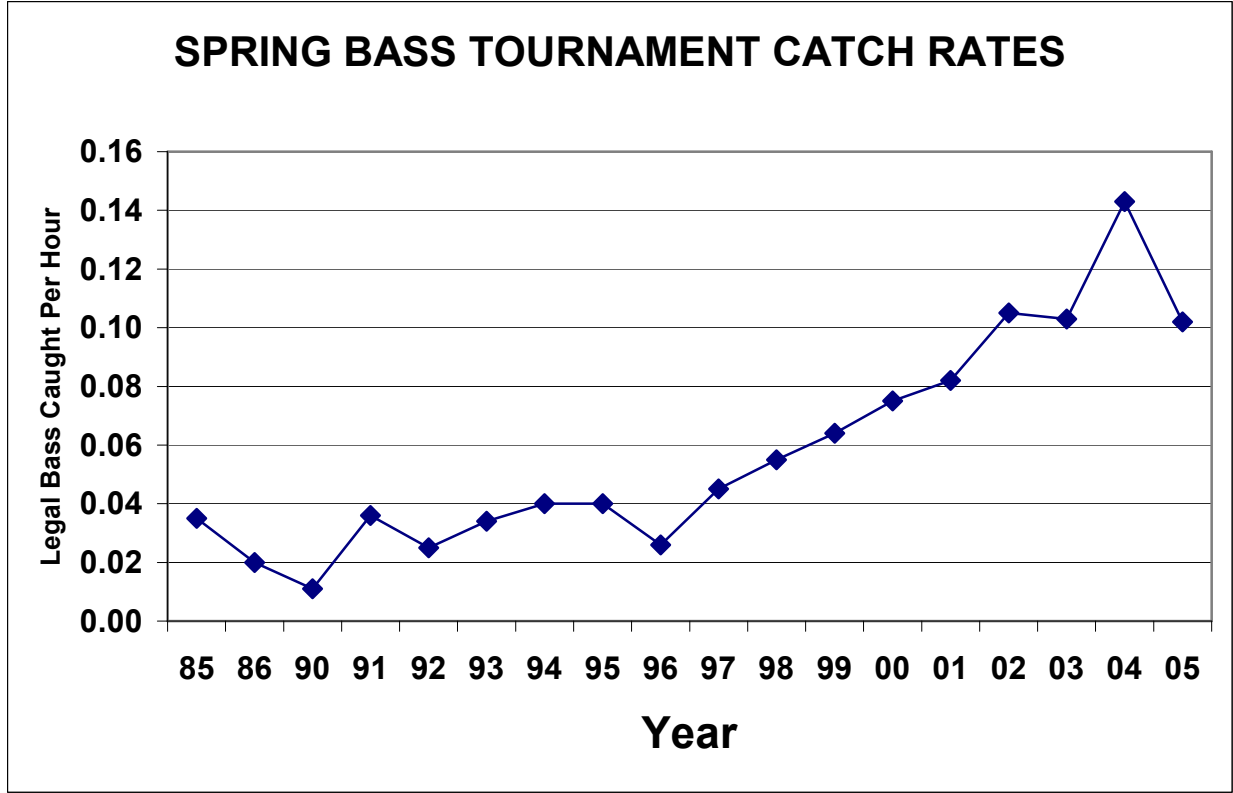


Figure 5. Spring tournament catch rates of largemouth bass longer than 15 in, Patoka Lake 1985, 1986, and 1990 through 2005.

APPENDIX 1

Supplemental Survey Data

APPENDIX 2

Largemouth Bass Tournament Monitoring Data

APPENDIX 3

Striped Bass Survey Data